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(57) Abstract

New and structurally distinct ultrasound contrast agents that comprise micron size microbubbles encapsulating a gas within a shell made from a blend of bipolar compounds having inter–molecular hydrophobic regions of mixed carbon chain length. The compounds have the following structure: R_1–X–Z; R_2–X–Z; and R_3–X–Z', where R_1, R_2 and R_3 are hydrophobic groups selected from the group consisting of straight–chained alkyls, alkylethers, alkylthiolethers, alkyldisulfides, polyfluoroalkyls, and polyfluoroalkylethers having a carbon chain length greater than or equal to 16 and less than or equal to 32 and where R_1 is greater than R_2 and R_1 is greater than or equal to R_3; R_3 has one or more such hydrophobic groups having the same or different lengths; X is a linker connecting the hydrophobic group to the polar head group; Z is a polar head group selected from the group consisting of CO_2–M^+, $SO_3^-M^+$, $SO_4^-M^+$, $PO_3^-M^+$, $PO_4^-M^+_2$, $N(R)_4^+$, a pyridinium or substituted pyridinium group, and a zwitterionic group; R is selected from the group consisting of –H, $-CH_3$, alkyl, cycloalkyl, substituted cycloalkyls containing one or more heteroatoms, and benzyl and can be the same or different; and Z' is a nonionic group.